

SAFETY NOTE 7

Determination of Acceptable Acoustic Absorbers

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Persons working in computer rooms have complained about high noise levels.¹ While these levels are usually below DOE prescribed guidelines, the constant machine "drone" is an annoyance.

Several options are available to deal with this problem. The most effective is partial or total enclosure of the noise source. Properly designed enclosures can provide a 20-25 decibel reduction. Unfortunately, enclosures interfere with ventilation and maintenance. In addition, the effectiveness of the enclosure is markedly reduced if any "leaks" are present. Use of earplugs or ear muffs is also an effective measure, but is unpopular since prolonged wear is often uncomfortable. Sound absorbing materials are the most commonly suggested method of noise control. They are available in a variety of forms, including acoustic tiles, blankets, panels, and baffles. Sound absorbing materials are usually porous and are effective in controlling reflected, or reverberant noise.

Noise absorbers may be constructed of a variety of materials. Among these are wool, mineral wool, fiberglass, and plastic foam. Care should be exercised in determining which material is appropriate for use. Some, such as fiberglass, polyurethane foam, and styrene are unacceptable. Fiberglass absorbers have a propensity to shed fibers. Polyurethane foam and styrene do not meet minimum fire code requirements. Fermilab policy² requires that building materials have a flame spread index <25. Typically polyurethane foams and styrene have flame spreads on the order of 400-500. In addition, when urethanes burn they release highly toxic fumes, including cyanide. Therefore, polyurethane foam or styrene sound absorbers may not be used at the Laboratory.

¹Threshold Limit Values for Chemical Substances and Physical Agents in the Work Environment with Intended Changes for 1983-84 ACHGIH

²Uniform Building Code (82), Sections 4204, 1712
Fermilab Safety Manual, Section 10.3

When considering materials to be used as sound absorbers, please contact Bill Riches or John Hall to determine if these materials are appropriate from a fire protection standpoint. In addition, the Safety Section is available for consultation on noise exposure and noise control techniques.

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